

## COMPLETE DISLOCATION OF PATELLA, REDUCED BY ARTHROTOMY AFTER SIX YEARS.

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THE following case I saw with Dr. J. D. Griffith, of this city, and later on assisted him in the operation:

Annie R., aged twenty-six, a stout, well-developed Quaker girl, first injured her right knee, in 1881, by having her heel suddenly slip off a small rock on which she was standing, her toe remaining on the rock. Her patella was thrown out of place by muscular effort, but almost immediately slipped back again, and she had a moderate synovitis following. Not long after this the dislocation was repeated, and was again reduced by the muscle traction. She continued to have trouble with the knee for months; she described it as "weak and uncertain." A year after the first injury the knee gave way while she was going down the porch steps, and she fell, doubling the leg violently under her and dislocating the patella farther out of line than it ever had been before. This time it did not go back, and her physician was unable to reduce it. A sharp attack of synovitis followed, which persisted for many weeks. When she finally tried to use the limb she found it quite useless. The patella remained on the outside of the knee. She could bear no weight on the leg except in the rigid extended position, and this was maintained with great difficulty. A stiff knee cap improved it somewhat, but even then it would frequently give way. This was most marked when she tried to go down stairs, and, as a consequence, she had several severe falls, which did not injure the knee again as far as she knows. She was able to flex the knee on the thigh, but when in the bent position she could put no weight upon it. She used one crutch continually.

About a week after the fall which resulted in the complete dislocation, she noticed that her right toe began to turn out more than



FIG. 1.—Dislocation of patella. Four years after operation.

the left, and that the whole leg was twisting round on the thigh. This twisting process had continued, growing worse yearly. In spite of the disability she had been able to do her work as a school teacher, by the aid of her crutch, most of the time. After five years she applied at St. Joseph's Hospital for treatment, when I first saw her.

Examination of the knee in July, 1888, showed a complete outward dislocation of the right patella, to the outside and behind the external condyle of the femur. There was a double rotation of the tibia and femur on their long axes; the femur was rotated inward; shown by the fact that when the thighs were brought together symmetrically the inner condyle of the right femur lay behind the inner condyle of the left, and the external condyle of the right leg projected anteriorly, so as to be in the median plane of the limb, occupying the same relative position as the left patella. The tibia had been drawn slightly backward and rotated outwards, so that when standing erect with heels together the right foot made a right angle with the left.

The patella was very movable laterally. When the leg was extended the patella came to the front directly over the external condyle; and when flexed, the patella rotated around the external condyle, keeping its under surface against the condyle until it was distinctly behind the condyle, with its anterior surface external and its inner edge anterior. The first effort to flex or extend the joint was followed by this direct lateral excursion of the patella backwards or forwards around the condyle. It moved in a double arc, one of which was determined by the ligamentum patellæ as the constant radius, the other being part of the circumference of the external condyle around which it revolved.

In consequence of the rotation of the femur and tibia motion at the knee-joint was also complicated. When extended the limb showed an in-knee. Flexion of the leg on the thigh caused the foot to describe a double arc, one in which the tibia formed the radius, and the other in a plane at right angles and tangent to the plane of the first, determined, of course, by the convexity of the two condyles and the circular movement of the articular surface of the tibia around them. When fully flexed the antero-posterior plane of the leg was at an angle of about fifteen degrees to the plane of the thigh.

The patient could put weight on the leg only when it was completely extended, and extension could be maintained only by keeping the patella in front of the condyle, which was largely assisted by

wearing a rigid knee-cap. It is evident that as soon as the patella revolved about the condyle (so as to be behind the centre of movement of the tibia upon the femur) the quadriceps ext. femoris instead of acting as an extensor and steadying the leg, acted as a flexor.

On July 9, 1888, the following described operation was performed, Dr. F. M. Johnson, of this city, also being present.

An incision was made from the tubercle of the tibia, six inches upwards in the median line. The joint was opened and the patella found outside the external condyle as described. It was not bound to it by adhesions, but was so firmly held by the outer part of the capsule of the joint that it required a four-inch incision to the outside of and parallel to the tendon of the quadriceps ext. femoris and the ligamentum patellæ to liberate it. The ligamentum patellæ was found to lead off from the tibia at a decided angle.

The incision made through the capsule from the inside of the joint allowed the patella to be readily brought back to its place between the condyles of the femur. It was as much dislocated now in its new position with reference to the tibia, as it had been before with reference to the femur, on account of the rotation of the bones. An attempt was made to reduce this secondary dislocation by forcibly rotating the tibia inwards, but with all the force we could bring to bear upon it we only succeeded in partly restoring the tibia. It was left in this partly reduced condition, with the hope that the muscular traction which had produced the secondary dislocation would act, now that the patella was in its normal situation, to completely restore the secondary defect remaining, and this ultimately proved to be the case.

The operation was completed by putting two drainage tubes through the joint, and closing the wound with silk sutures. She made a good recovery; the wound healed by first intention, the tubes were shortly removed, and after three weeks passive movement of the leg began. Six weeks after the operation she could flex the knee through an arc of fifteen degrees, and was able to put her weight upon it and could walk with a cane.

I have recently examined the knee, now four years since the operation. The dislocation has never recurred. There is no excess of fluid in the joint, which works smoothly and without pain. The femur and tibia are in exact line, and there is no rotation.

She is able to walk long distances without even a cane, and without limp or hitch. She can flex the leg on the thigh through an

arc of about forty-five degrees, further motion being apparently limited by adhesions in the joint at the site of the drainage tubes. The ability to flex the joint has steadily increased since she left the hospital. The inability to flex the leg to a greater degree interferes somewhat with her comfort while sitting, and prevents her going down stairs in the usual way, as she has to go down one stair at a time, but in other respects the limb is as useful as its fellow.